Air Quality Permitting
Statement of Basis

March 7, 2005

Permit to Construct No. P-040002

Crookham Company, Caldwell

Facility ID No. 027-00020

Prepared by:

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AIR QUALITY DIVISION

PROPOSED FOR PUBLIC COMMENT

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Acronyms, Units, and Chemical Nomenclatures

AIRS	Aerometric Information Retrieval System
AQCR	Air Quality Control Region
CO	carbon monoxide
DEQ	Department of Environmental Quality
EPA	U.S. Environmental Protection Agency
IDAPA	a numbering designation for all administrative rules in Idaho promulgated in accordance with the Idaho Administrative Procedures Act
lb/hr	pound per hour
NO_x	nitrogen oxides
NSPS	New Source Performance Standards
PM	particulate matter
PM_{10}	particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers
PTC	permit to construct
Rules	Rules for the Control of Air Pollution in Idaho
SIP	State Implementation Plan
SO_2	sulfur dioxide
T/yr	tons per year
$\mu g/m^3$	micrograms per cubic meter
VOC	volatile organic compound

1. PURPOSE

The purpose for this memorandum is to satisfy the requirements of IDAPA 58.01.01.200, Rules for the Control of Air Pollution in Idaho, for issuing permits to construct.

2. FACILITY DESCRIPTION

Crookham Company (Crookham) is a seed processing facility located in Caldwell, Idaho. The facility processes various types of seeds including corn, onion, and carrot. Seed processing includes husking, shelling, scalping, drying, sizing, and packaging.

3. FACILITY / AREA CLASSIFICATION

Crookham is defined as a natural minor facility because without permit limits on the potential to emit, the emissions of any single pollutant would not exceed 100 tons per year. The AIRS classification is "B".

The facility is located within AQCR 64 and UTM Zone 11. The facility is located in Canyon County which is designated unclassifiable for all criteria pollutants.

The AIRS information provided in Appendix C defines the classification for each regulated air pollutant at Crookham.

4. APPLICATION SCOPE

The purpose of this PTC is to allow Crookham to increase their hours of operation to 3,000 hours per consecutive 12-month period (hr/yr) and to increase their annual production limit to 20,000 tons of seeds per consecutive 12-month period (T/yr).

4.1 Application Chronology

February 2, 2004	DEQ received a PTC application from Crookham for an increase in production and hours of operation
March 2, 2004	DEQ determined the application incomplete
March 15, 2004	DEQ received updated application materials
April 7, 2004	DEQ determined the application complete

5. PERMIT ANALYSIS

This section of the Statement of Basis describes the regulatory requirements for this PTC action.:

5.1 Equipment Listing

Crookham has added two baghouses to control the husking and shelling emissions. For a complete list of other equipment see the technical memorandum dated January 18, 2002.

5.2 Emissions Inventory

Crookham estimated the potential emissions increase using AP-42 emissions factors for grain handling and receiving, and the control efficiency of the baghouses and cyclones. The emission factor used is the sum of the receiving emissions factor and the grain handling emissions factor in AP-42 Table 9.9.1-1. The sum of the two emissions factors is a conservative estimate for all seed handling operations at the facility because it accounts for emissions from seed transfer and dropping seed into bins, whether or not that particular operation generates emissions in both of those manners.

The following table summarizes the estimated particulate matter with an aerodynamic diameter of less than or equal to a nominal 10 micrometers (PM_{10}) emissions from the Crookham facility after the increase in production and hours of operation limits. Appendix A contains a detailed emissions estimate for this facility.

Table 5.1 ESTIMATED FACILITY-WIDE PM_{10} EMISSIONS

	Hourly Emission Rate (lb/hr)
Receiving	7.70E-01
Husking	1.81E-02
Sheller	2.46E-02
Scalper	2.09E-03
Cyclone 4W1	1.70E-03
Cyclone 4W2	1.70E-03
Cyclone 6E1	7.43E-03
Cyclone 6E2	7.43E-03
Cyclone 6W1	4.95E-03
Cyclone 6W2	4.95E-03
Cyclone 6W3	4.95E-03
Cyclone 5E	2.42E-03
Sorting (E1)	7.65E-04
Bagging	1.12E-02
Dryer Burners	6.33E-01

5.3 Modeling

The applicant modeled the facility's PM_{10} emissions to determine if the increase in production would cause or contribute to a violation of the national ambient air quality standards (NAAQS) for PM_{10}. DEQ reviewed the model and determined that the project will not cause a violation of the NAAQS for PM_{10}. The following table summarizes the modeling analysis. A detailed review of the modeling analysis is included in Appendix B.

Table 5.1 FULL IMPACT ANALYSIS RESULTS

Pollutant	Averaging Period	Year	Concentration ($\mu g/m^3$)	Background Concentration ($\mu g/m^3$)	Total Concentration ($\mu g/m^3$)	NAAQS ($\mu g/m^3$)	Percent of NAAQS
PM_{10}	24-hour	91	66.9	81	147.9	150	98.6%
	Annual	91	16.9	27	43.9	50	87.7%

5.4 Regulatory Review

This section describes the regulatory analysis of the applicable air quality rules with respect to this PTC.

IDAPA 58.01.01.201.....Permit to Construct Required

The increase in annual production and hours of operation limits requires a permit to construct because the existing Tier II operating permit prohibits operating more than 1,210 hr/yr or processing more than 14,000 T/yr of seeds.

5.5 Fee Review

This permit is subject to a $1,000 application fee in accordance with IDAPA 58.01.01.224. Crookham paid the application fee on October 16, 2003. This application is also subject to a $1,000 processing fee in accordance with IDAPA 58.01.01.225 for a project with an emissions increase of less than one ton per year. The estimated facility-wide PM_{10} emissions are 0.54 T/yr from point sources.

6. PERMIT CONDITIONS

DEQ reviewed Crookham's Tier II operating permit and determined that some of the permit conditions were unenforceable, redundant, or incorrect. Additionally, there are discrepancies in the PTC application dated and received by DEQ on July 12, 2001 and the application materials received for this permit modification. Therefore the entire permit was revised in order to make this permit federally enforceable and consistent with the current operating system. The following paragraphs describe the permit conditions.

Seed Processing Operations

6.1 Permit Condition 2.2 limits the opacity of any visible emissions to no more than 20% for a period or periods aggregating more than three minutes in any consecutive 60-minute period.

6.2 Permit Condition 2.3 limits the mass of input that Crookham can process to 20,000 tons per any consecutive 12-month period (T/yr). This limit was increased, as requested by the applicant, from 14,000 T/yr. Additionally, the daily throughput of the receiving area is limited to 500 tons per day. These limits are necessary to assure compliance with the NAAQS for PM_{10}.

6.3 Permit Condition 2.4 limits the annual hours of operation to no more than 3,000 hours per consecutive 12-month period (hr/yr). This limit was increased, as requested by the applicant, from 1,210 hr/yr. This permit condition also limits the daily hours of operation of the receiving area. The annual hours of operation limit is necessary to assure compliance with the annual PM_{10} NAAQS and the daily hours of operation limit is necessary to demonstrate compliance with the 24-hour NAAQS.

6.4 Permit Condition 2.5 requires the permittee to operate baghouses to control emissions from the sheller, husker, scalper, treating and bagging, and electronic sorting operations.

6.5 Permit Condition 2.6 requires the facility to monitor and record the hours of operation each week during weeks when the facility is operating. This condition also requires that Crookham monitor the amount of raw material received each day that the receiving area is operating. This condition is necessary to demonstrate compliance with Permit Conditions 2.3 and 2.4.

Fugitive Dust Control

6.6 Permit Condition 3.1 requires the facility to reasonably control fugitive emissions in accordance with IDAPA 58.01.01.650-651. The condition also requires the facility to maintain records of any fugitive dust complaints, and the permittee's assessment of the conditions as well as any corrective action taken.

6.7 Permit Condition 3.2 contains specific fugitive emission dust control strategies for the receiving area and unpaved parking lots. The permittee is required to use windbreaks around the receiving area, construct cloth barriers around the receiving hopper, install water sprays on the hopper and shaker, and apply dust suppressant to the unpaved parking lots to reasonably control fugitive emissions. The permittee is required to conduct daily monitoring, by personnel with formal visible emissions training, of the receiving area. If visible emissions are observed leaving the receiving area the permittee is required to take corrective action as soon as practically possible.

6.8 Permit Condition 3.3 requires that visible emissions not be visible at, or beyond the property boundary. This permit condition was in the original permit and is used to assure that fugitive emissions are being reasonably controlled.

6.9 Permit Condition 3.4 requires the facility to conduct monthly facility-wide inspections of potential sources of fugitive emissions to assess whether fugitive emissions are being reasonably controlled. If fugitive emissions are not being reasonably controlled the permittee is required to take corrective action as soon as practically possible. Records of the monthly inspections are required to be kept onsite.

6.10 Permit Condition 3.5 requires the facility to conduct a monthly visible emissions inspection at the property boundary using EPA Method 22. If visible emissions are observed leaving the property boundary the permittee is required to take corrective action as soon as practically possible. Records of the monthly inspections are required to be kept onsite.

7. ADA COUNTY PM_{10} MAINTENANCE PLAN

Crookham's Tier II operating permit was included in the Ada county PM_{10} maintenance plan. The specific conditions referenced in the federal register notice were the emission limits, visible emission limits, operating hours, production limit, monitoring operation parameters (hours of operation and visible emissions), and monitoring quantity of material received. This permit to construct modifies those conditions. The new permit contains a higher production limit, higher hours of operation, different emissions limits, and different monitoring requirements. However, the overall annual emissions from this facility will be reduced due to the installation of two baghouses and incorporation of a fugitive dust management plan.

The production in the Tier II permit was limited to 14,000 tons of material received per year. This permit raises that limit to 20,000 tons of material per year. Additionally, this permit increases the annual hours of operation limit from 1,210 hr/yr to 3,000 hours per year. This will increase annual emissions from some processes at this facility, although the overall annual emissions from this facility will be reduced due to the installation of two baghouses and incorporation of a fugitive dust management plan. The sheller and scalper now have baghouses rather than cyclones. The receiving area now has a fugitive dust plan that includes construction of wind breaks, installation of cloth barriers at the receiving hopper, and installation of water sprays on the receiving hopper and shaker. The unpaved parking lots will be treated with a dust suppressant when necessary to control fugitive dust. The permittee is required to conduct daily fugitive dust monitoring of the receiving area during operation. If visible emissions are observed leaving the receiving area the permittee is required to take corrective action as soon as practically possible.

Additionally, DEQ required Crookham to model the uncontrolled emissions from the receiving area to demonstrate that the emissions from this facility would not cause a violation of the NAAQS for PM_{10}.

8. PUBLIC COMMENT

An opportunity for public comment period on the PTC application was provided, in accordance with IDAPA 58.01.01.209.01.c., from April 13, 2004 to May 13, 2004. DEQ is providing this permit for public comment in accordance with IDAPA 58.01.01.209.01.c.

9. RECOMMENDATION

Based on review of application materials, and all applicable state and federal rules and regulations, staff recommend that Crookham be issued draft PTC No. P-040002 for the increase in production and hours of operation limits. This permit will be submitted for a public comment period prior to final issuance.

DH/sd Permit No. P-040002

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APPENDIX A

EMISSIONS CALCULATIONS

APPENDIX B

MODELING ANALYSIS

MEMORANDUM

DATE: November 18, 2004

TO: Kevin Schilling, Stationary Source Modeling Coordinator

FROM: Dustin Holloway, Modeling Analyst

PROJECT NUMBER: P-040002

SUBJECT: Modeling Review for the Crookham Company in Caldwell

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1.0 SUMMARY

Industrial Hygiene Resources, Inc. conducted facility-wide PM_{10} dispersion modeling in support of a permit to construct (PTC) application for the Crookham Company (Crookham) in Caldwell to demonstrate that the stationary source would not cause or significantly contribute to a violation of a national ambient air quality standard (NAAQS). The following table summarizes the key assumptions used in the analysis.

Table 1.1 KEY ASSUMPTIONS USED IN MODELING ANALYSIS SUBMITTED BY THE APPLICANT

Assumption	Explanation
The receiving, husking, and sizing operations only operate between 7 am and 5 pm	DEQ ran a sensitivity analysis assuming that the receiving area is the only source with limited hours of operation. The resulting concentrations were within the applicable NAAQS. However, the receiving area, which was modeled at 11 hours per day, accounts for a large portion of the facility's ambient concentrations.
The bagging operation only operates between 8 am and 4 pm	
The sorting operation only operates between 7 am and 7 pm	

Based on DEQ's sensitivity analysis and the changes made to the model, this analysis demonstrates, to DEQ's satisfaction, that the project will not cause or significantly contribute to a violation of any ambient air quality standards.

2.0 BACKGROUND INFORMATION

2.1 Applicable Air Quality Impact Limits

The Crookham facility is located in Canyon County. Canyon County is designated unclassifiable for all criteria air pollutants. However, this facility was included in the Ada county PM_{10} maintenance plan. The following table summarizes the applicable regulatory limits for this area.

Table 2.1 APPLICABLE REGULATORY LIMITS				
Pollutant	**Averaging Period**	**Significant Contribution Levels ($\mu g/m^3$)[a, b]**	**Regulatory Limit ($\mu g/m^3$)[c]**	**Modeled Value Used[d]**
PM_{10}[e]	Annual	1	50[f]	Maximum 1st highest[g]
	24-hour	5	150[h]	Maximum 6th highest[i] Highest 2nd highest[j]

[a] IDAPA 58.01.01.006.93
[b] Micrograms per cubic meter
[c] IDAPA 58.01.01.577 for criteria pollutants, IDAPA 58.01.01.585 for non-carcinogenic toxic air pollutants IDAPA 58.01.01.586 for carcinogenic toxic air pollutants.
[d] The maximum 1st highest modeled value is always used for significant impact analysis and for all toxic air pollutants.
[e] Particulate matter with an aerodynamic diameter less than or equal to a nominal ten micrometers
[f] Never expected to be exceeded in any calendar year.
[g] Concentration at any modeled receptor.
[h] Never expected to be exceeded more than once in any calendar year.
[i] Concentration at any modeled receptor when using five years of meteorological data.
[j] The highest 2nd high is considered to be conservative for five years of meteorological data.

2.2 Background Concentrations

This modeling analysis uses the default background concentrations for small town/suburban areas in DEQ's background concentration data.[1] The following table summarizes the applicable background concentrations for this area.

Table 2.2 BACKGROUND CONCENTRATIONS.		
Pollutant	**Averaging Period**	**Background concentrations ($\mu g/m^3$)[a]**
PM10	24-hour	81.0
	Annual	27.0

[a] Micrograms per cubic meter.

[1] Hardy, Rick and Schilling, Kevin. *Background Concentrations for Use in New Source Review Dispersion Modeling*. Memorandum to Mary Anderson, March 14, 2003.

3.0 ASSESSMENT OF MODELING ANALYSIS

3.1 Modeling Methodology

Table 3.1 MODELING PARAMETERS.		
Parameter	**What Facility Submitted**	**DEQ's Review/Determination**
Model Selection	ISCPrime	This model is appropriate for the Crookham facility because fenceline receptors are located within building circulation cavities. The PRIME downwash algorithm calculates concentrations within the cavity region, whereas ISCST3 cannot.
Meteorological Data	Boise 1987-1991	This is the most representative data available for this area.
Model Options	Regulatory defaults	Appropriate for this analysis.
Land Use	Rural	Appropriate for this area.
Complex Terrain	The applicant chose both flat and complex terrain, although all receptors have the same elevation	This facility is located in flat terrain and the maximum concentrations occur on the facility fenceline. The receptor elevations used are appropriate for this facility.
Building Downwash	Downwash was included.	The facility's buildings are located near the fenceline and the maximum concentrations occur in the cavity regions. Downwash needs to be accounted for.
Receptor Network	The analysis uses 20-50 meter spacing along the fenceline; 75 meter spacing out to 250 meters; 150 meter spacing out to 1,000 meters	DEQ added some receptors in an area where the ambient air boundary was questionable. However, this did not change the resulting maximum concentrations
Facility Layout	N/A	The facility layout included all of the buildings identified on the facility plot plan which could affect air dispersion from any of the sources at Crookham.

The 17 dryer burners were modeled as if all emissions came from a single stack. The stack used in the model had an exit diameter of 123 feet, temperature of 95°F, and an exit flow rate of 69 actual cubic feet per minute. Inflating the stack diameter effectively reduced the exit velocity to nearly zero meters per second while maintaining the exit flow rate. This method is appropriate for certain situations where the exhaust gas is more buoyant than ambient air to assure thermal buoyancy of the plume is considered by the model. However, the PRIME algorithm in ISCPrime uses the stack diameter in the dispersion calculation, and inflation of the stack diameter causes erroneous results. DEQ changed the modeling analysis by reducing the stack diameter to one foot and resetting the exit velocity to 0.001 meters per second (m/s). The resulting concentrations exceeded the 24-hour NAAQS standard for PM_{10}. DEQ then worked with the facility and found that the 17 burners are spread out among four separate buildings. Three of the buildings contained five burners each and the other contained two burners. Additional emissions points were added to represent the separate locations of the burners. The emissions were split out by dividing the number of burners in one particular building by the total number of burners.

The applicant's submittal did not contain any estimates of the receiving area as advised by DEQ during the application process. However, during permit processing DEQ determined that modeling of fugitive emissions associated with processing will be required for any modification or new facility that is located in a PM_{10} maintenance area. Therefore, DEQ included the receiving area in the modeling analysis. The receiving area was modeled with the same parameters used in a previous permit application.

3.2 Emission Rates

The following table summarizes the emissions rates used in this modeling analysis.

Table 3.2 EMISSION RATES

	Hourly Emission Rate
Receiving (R1)	7.70E-01
Husking (H1)	1.81E-02
SHELLER	2.46E-02
SCALPER	2.09E-03
S3 (4W1)	1.70E-03
S3 (4W2)	1.70E-03
S3 (6E1)	7.43E-03
S3 (6E2)	7.43E-03
S3 (6W1)	4.95E-03
S3 (6W2)	4.95E-03
S3 (6W3)	4.95E-03
S3 (5E)	2.42E-03
E1SORT	7.65E-04
B1BAG	1.12E-02
DREYERS1	9.3E-02
DREYERS2	9.3E-02
DREYERS3	9.3E-02
DREYERS4	9.3E-02
DREYERS5	7.4E-02
DREYERS6	1.86E-01

The emissions in the table are the maximum hourly rates used in the model. The applicant's submittal assumed that the receiving, husking, and sizing operations only operate between 7 am and 5 pm, the bagging operation only operates between 8 am and 4 pm, and the sorting operation only operates between 7 am and 7 pm. Additionally, after the receiving area was added, the burner operations were assumed to only operate during the fall and winter seasons.

3.3 Emission Release Parameters

The following table summarizes the release parameters for the sources in this analysis. The husker baghouse exit diameter was incorrect in the initial submittal. DEQ corrected the diameter to accurately account for the exit area of the baghouse.

Table 3.3 POINT SOURCE STACK PARAMETERS							
	Easting (m)	Northing (m)	Elevation (m)	Height (ft)	Temperature (°F)	Exit Velocity (m/s)	Diameter (ft)
H1	524,015	4,835,080	715	47	70	148.7	0.92
SHELLER	524,110	4,835,120	715	40	70	37.1	1.5
SCALPER	524,190	4,835,080	715	40	70	19.4	1
S3(6E2)	524,160	4,835,085	715	33	70	27.3	1.5
S3(4W1)	524,104	4,835,090	715	33	70	69.0	1.5
E1SORT	524,308	4,835,155	715	10	70	19.4	1
B1BAG	524,308	4,835,075	715	10	70	19.4	1
S3(4W2)	524,104	4,835,085	715	33	70	6.9	1.5
S3(5E)	524,160	4,835,085	715	33	70	7.2	1.5
S3(6W1)	524,104	4,835,087	715	33	70	18.4	1.5
S3(6W3)	524,104	4,835,080	715	33	70	18.4	1.5
S3(6W2)	524,104	4,835,082	715	33	70	18.4	1.5
S3(6E1)	524,160	4,835,090	715	33	70	27.3	1.5
DRYERS1	524,043.3	4,835,152	715	10	95	0.001	1
DRYERS2	524,072.7	4,835,152	715	10	95	0.001	1
DRYERS3	524,042	4,835,126	715	10	95	0.001	1
DRYERS4	524,072	4,835,126	715	10	95	0.001	1
DRYERS5	524,068	4,835,088	715	10	95	0.001	1
DRYERS6	524,142	4,835,135	715	10	95	0.001	1

Table 3.4 AREA SOURCE RELEASE PARAMETERS							
	Easting (m)	Northing (m)	Elevation (m)	Release Height (m)	Easterly Length (m)	Northerly Length (m)	Angle from North
R1	524,000	4,835,120	715	3.05	0.00975	0.00975	0

The stack diameter and exit flow velocities of the dryers were changed by DEQ because ISCPrime miscalculates concentrations when an inflated stack diameter is used to account for buoyant plume rise. The stack diameter was set to one foot for each stack and the exit velocity to 0.001 m/s. These stack parameters result in higher concentrations because they don't account for buoyant plume rise.

3.4 Results

3.4.1 Sensitivity Analysis Results

DEQ conducted a sensitivity analysis to determine if the daily hours of operation of the husker, sheller, scalper, sorting bins, baghouses, and cyclones effect the maximum ambient concentrations. The only source with limited daily hours of operation is the receiving area. The resulting impacts were nearly identical to the analysis with restricted hours of operation. Based on the results of the sensitivity analysis daily hours of operation limits are not necessary for these sources. The only source that should have a limit on daily hours of operation is the receiving area.

3.4.2 *Full Impact Analysis Results*

Table 3.5 FULL IMPACT ANALYSIS RESULTS							
Pollutant	Averaging Period	Year	Concentration ($\mu g/m^3$)	Background Concentration ($\mu g/m^3$)	Total Concentration ($\mu g/m^3$)	NAAQS ($\mu g/m^3$)	Percent of NAAQS
PM_{10}	24-hour	91	66.9	81	147.9	150	98.6%
	Annual	91	16.9	27	43.9	50	87.7%

The results of the modeling analysis demonstrate, to DEQ's satisfaction, that the increase in production will not cause or significantly contribute to a violation of any ambient air quality standards.

APPENDIX C

AIRS INFORMATION

AIRS/AFS[a] FACILITY-WIDE CLASSIFICATION[b] DATA ENTRY FORM

Facility Name: Crookham Co.
Facility Location: Caldwell
AIRS Number: 027-00020

AIR PROGRAM POLLUTANT	SIP	PSD	NSPS (Part 60)	NESHAP (Part 61)	MACT (Part 63)	SM80	TITLE V	AREA CLASSIFICATION A-Attainment U-Unclassified N- Nonattainment
SO_2	B						B	U
NO_x	B						B	U
CO	B						B	U
PM_{10}	SM						SM	U
PT (Particulate)	SM						SM	U
VOC	B						B	U
THAP (Total HAPs)	B						B	U
			APPLICABLE SUBPART					

[a] Aerometric Information Retrieval System (AIRS) Facility Subsystem (AFS)

[b] AIRS/AFS Classification Codes:

A = Actual or potential emissions of a pollutant are above the applicable major source threshold. For HAPs only, class "A" is applied to each pollutant which is at or above the 10 T/yr threshold, **or** each pollutant that is below the 10 T/yr threshold, but contributes to a plant total in excess of 25 T/yr of all HAPs.

SM = Potential emissions fall below applicable major source thresholds if and only if the source complies with federally enforceable regulations or limitations.

B = Actual and potential emissions below all applicable major source thresholds.

C = Class is unknown.

ND = Major source thresholds are not defined (e.g., radionuclides).